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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,018	02/11/2004	Jingsheng Chen	17184-002001 / E.20040013	2232
26161	7590	02/10/2006	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			JOLLEY, KIRSTEN	
			ART UNIT	PAPER NUMBER
			1762	
DATE MAILED: 02/10/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/777,018	<b>Applicant(s)</b> CHEN ET AL.	
	<b>Examiner</b> Kirsten C. Jolley	<b>Art Unit</b> 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,7-10,12-15 and 34-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,7-10,12-15,34,37-42 and 45-48 is/are rejected.
- 7) ☒ Claim(s) 35,36,43 and 44 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. The claim rejections over the prior art of Lamberton et al. and Ejiri have been withdrawn in response to Applicant's arguments stating that Applicant's foreign priority date predates the U.S. filing dates of Lamberton and Ejiri. Upon further inspection of the foreign priority document, it was noted that the document is in English and provides support for the claimed invention, therefore Applicant's claims have been given priority back to the foreign priority date of February 11, 2003.

2. As to the Ryonai reference, Applicant points out that original claims 4, 9, and 12 were not rejected over the Ryonai references and these claims have been pulled into original claim 1 to form the amended/new independent claims. However, upon further consideration, independent claims 1 and 42 are now rejected over the Ryonai reference for the reasons discussed below. Additionally, in updating the Examiner's search, the prior art of Shimizu et al. was found. New rejections over Shimizu et al. are set forth below. Accordingly, this Office action is made non-final.

### ***Claim Objections***

3. Claim 34 is objected to because of the following informalities: In line 4 of claim 34, there should be a semi-colon at the end of the line instead of a period. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 7-10, and 12-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 7 of claim 1, “by being heated in gas phase” is vague and indefinite because it is not clear whether the claim requires that the nanoclusters themselves are required to be present in a gas phase (i.e., floating in gas), or whether the heating step itself is performed in a gas phase (i.e., using heated gas). Since the specification discloses both scenarios, it is unclear what is required by the claims.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 34, 38, 42, and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimizu et al. (US 2003/0091868).

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With respect to claims 34, 38, and 41, Shimizu et al. discloses a method for forming a thin film magnetic recording media comprising: generating magnetic nanoclusters (paragraphs 0168-0170) to form a perpendicular magnetic film 4; mixing the magnetic nanoclusters with a nono-magnetic material such as Pd or Pt (paragraphs 0114 and 0148); crystallizing the magnetic nanoclusters; and depositing the magnetic nanoclusters onto a substrate to form a thin film of magnetic particles thereon. It is noted that sputtering by alternating a first target containing a magnetic material and a second target containing a non-magnetic material would result in mixing the magnetic nanoclusters with non-magnetic material. Further, Shimizu et al. teaches that the easy axes of the magnetic particles are oriented vertically/perpendicular to the surface of the substrate. As to the limitations requiring use of a magnetic field adjacent to the substrate to control orientation of the magnetic particles upon deposition, the Examiner notes that Shimizu et al. teaches use of a magnetic head for recording data onto the medium, which uses a magnetic field (paragraph 0210).

8. Claims 1, 9-10, 34, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Ryonai et al. (US 6,242,085).

Ryonai et al. discloses a method for forming a thin film magnetic recording medium comprising the steps of: generating magnetic nanoclusters (col. 4, lines 3-12); crystallizing the magnetic nanoclusters; and depositing the magnetic nanoclusters onto a substrate to form a thin film of magnetic particles thereon. It is known that the magnetic nanoclusters that are formed and deposited are crystallized because col. 6, lines 37-39 refers to the magnetic particles as *magnetic crystals*.

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With respect to the limitation in claim 1 requiring that the magnetic nanoclusters are crystallized by being heated in gas phase, Ryonai et al. states “As the substrate temperature is raised, the growth of the magnetic crystals is accelerated” (col. 6, lines 37-38). Therefore, heating does cause crystallization to occur. While it is the substrate that is heated (instead of using a heated gas atmosphere), the nanocrystals on the substrate are also heated and are present on the substrate in a gaseous atmosphere, therefore it is the Examiner’s position that the claim limitation of crystallization “by being heated in gas phase” is met by the Ryonai et al. reference.

With respect to claims 9 and 34, Ryonai et al. teaches that the magnetic nanoclusters are mixed with a non-magnetic material (col. 4, lines 13-22). As to the limitation requiring “wherein the mixing is performed before the magnetic nanoclusters are crystallized,” it is noted that the sputtering of both magnetic and non-magnetic materials occurs in the Example prior to raising the substrate temperature which causes growth of magnetic crystal to accelerate.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 12-15, 39-41, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (US 2003/0091868).

With respect to claim 1, Shimizu et al. discloses a method for forming a thin film magnetic recording media comprising: generating magnetic nanoclusters (paragraphs 0168-

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0170) to form a soft magnetic undercoat film 2; depositing the magnetic nanoclusters onto a substrate to form a thin film of magnetic particles thereon; and crystallizing the magnetic nanoclusters by heating/annealing (paragraphs 0142-0143). While Shimizu et al. does not specifically state that the heating/annealing step is performed by exposing the undercoat film to heat in a gas phase (as opposed to performing the annealing step in a vacuum), it is the Examiner's position that it would have been obvious to one having ordinary skill in the art to have performed the annealing step in an atmosphere of heated air or gas since such would be more economical and because Shimizu et al. does not provide a teaching stating otherwise. As to claim 12 and the limitations requiring use of a magnetic field adjacent to the substrate to control orientation of the magnetic particles upon deposition, the Examiner notes that Shimizu et al. teaches use of a magnetic head for recording data onto the medium, which uses a magnetic field (paragraph 0210).

11. Claims 12-15, 38-42, and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryonai et al. as applied to claims 1 and 34 above, and further in view of Shimizu et al.

The Ryonai et al. reference is applied for the reasons discussed above in section 8. With respect to the limitation requiring "providing a magnetic field adjacent to the substrate to control the orientation of the magnetic particles upon deposition," it is noted that the Ryonai et al. reference teaches that its magnetic recording medium is suitable for high density recording (col. 8, line 24). Shimizu et al. is cited to demonstrate that recording on a magnetic recording medium

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comprises use of a magnetic head, and such necessarily uses a magnetic field adjacent to the substrate to control the orientation of the magnetic particles (paragraph 0210).

***Allowable Subject Matter***

12. Claims 35-36 and 43-44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach or fairly suggest the claimed steps of generating magnetic nanoclusters, mixing the nanoclusters with a non-magnetic material, crystallizing the magnetic nanoclusters and depositing the nanoclusters onto a substrate to form a thin film of magnetic particles thereon, wherein the non-magnetic material comprises an organic solvent or a surfactant. The prior art of Ryonai et al. and Shimizu et al. disclose sputtering a non-magnetic material, and therefore the non-magnetic material does not comprise either solvent or surfactant.

13. Claims 7-8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claims 7-8 are allowable over the prior art for similar reasons as discussed above in section 12.

***Conclusion***

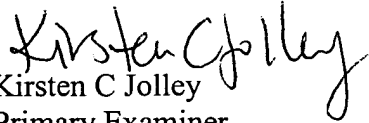
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Wednesday.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Kirsten C Jolley  
Primary Examiner  
Art Unit 1762

kcj